

bryonary cells, with this constant difference, that they are themselves spontaneously formed, and become the determining cause of the evolution of the latter.

“ 2. As to the development of the tail, or the vibratile cilia of the spermatozoa of algæ and of animals, and the movements they present, these are not more astonishing than the formation of vibratile cilia on the surface of epithelial cells of mucous membrane, and both are, without doubt, of the same, and as yet unknown, nature. But the movements they exhibit are not of themselves sufficient to characterize spermatozoa as animals, no more than the carrying about of an epithelial cell, or of a spore of fucus by the agency of cilia can constitute either of those an animal; in fine, they are no more animals than are embryonic cells.

“ 3. It being once recognised that an ovule is formed by the male apparatus analogous to that produced by the female, and presenting an identity with the latter in its evolution, two series of ovules may be naturally formed:—

“ A.—Of male ovules.

“ 1. Those of animals (parent zoospermic utricles).

“ 2. Those of cryptogamic plants (antheridia, or cells fulfilling their purpose in the *Ulvaceæ* and other cryptogamia).

“ 3. Those of phanerogamous plants (parent-cells of pollen).

“ B.—Of female ovules, or ovules strictly so called.

“ 1. Those of animals (ova).

“ 2. Those of cryptogamic plants (spores, some zoospores, sporules).

“ 3. Those of phanerogamic plants (vegetable embryonary sac).

“ All ovules or ova are constituted essentially of a vitellus with its germinal vesicle and vitelline membrane. But in the male ovules the division of the vitellus is a primitive phenomenon, spontaneous, and always limited to the formation of spermatozoa—the true embryonary cells of the male, which have the property of determining in the female ovule the same phenomenon (self-division) which has given them birth, and which proceeds in the latter to the evolution of the embryo. The female ovules, on the contrary, form the second series of organs, the vitellus of which, in order to become divided in its turn, and to form the primary cells of the embryo, needs the concurrence of the spontaneously developed products of the male vitellus.”—*Comptes Rendus*.

On the Gum Kino of the Tenasserim Provinces.

By the Rev. F. MASON.

In a valuable article by Dr. Royle on Gum Kino, reprinted in the Journal of the Agricultural and Horticultural Society of India, which ostensibly enumerates all the various regions from which it has been imported into England, there is no mention of this article being imported from this coast. Yet long before Dr. Royle compiled that communication, more than one consignment had been made by parties in Maulmain to houses in London of gum kino to the amount of a thousand pounds.

It was brought to Maulmain by an English merchant from the

Shan States, and stated by him, as our commissioner at the time informed the writer, to be the production of the *Pa-douk*, the same tree as the one in Maulmain thus denominated by the Burmans. Several years before I had directed attention to this tree as producing an astringent gum resembling gum kino, but the medical officer to whom I submitted specimens of the gum said it was "a kind of dragon's blood;" but after it was known that the gum of the *Pa-douk* had been sold in London for the veritable gum kino, another medical gentleman tried in his practice the exudation of the tree in his compound in the place of the gum kino in his stores, and reported the effects the same, that their medical virtues were alike.

The next inquiry that arises is for the genus and species of the *Pa-douk*. When I first came to the coast, all the English residents of my acquaintance called it "Burman Senna," and the surgeon of the station told me that he believed it was a species of senna. The Rev. H. Malcom, D.D., President of Georgetown College, Kentucky, who came out to India a dozen years ago in order to go back again and write a book, has stereotyped in his travels,—"*Pa-douk*, or Mahogany (*Swietenia Mahogáni*), is plentiful in the upper provinces, especially round Ava, found occasionally in Pegu." In a native Pali dictionary, found in the Burmese monasteries, *Pa-douk* stands as the definition of *Pe-tá-thá-lá*, and the corresponding Sanscrit word in Wilson's Dictionary is defined *Pentaptera*; but the *Pa-douk* does not belong to that genus. In Piddington's Index however *Peetshala* stands as the Hindee name, and in Voigt's Catalogue *Peet-sal* as the Bengalee name of *Pterocarpus marsupium*; and this brings us nearer the truth, for *Pa-douk* is a name common to two different species of *Pterocarpus*, but which look so much alike that they are usually regarded as one species. Undoubtedly one species is *P. Indicus*, and the other I presume is the one named by Wight *P. Wallichii*, but which was marked in Wallich's Catalogue *P. Dalbergioides*, from which it differs in no well-marked character excepting that the racemes are axillary and simple, while in the latter they are terminal and "much-branched." Wight says of *P. Wallichii* in his Prodrômus, "stamens all united or split down on the upper side only;" so they are sometimes in our tree. In the figure that he gives in his Illustrations they are represented as diadelphous, nine and one, and so they are seen occasionally in our tree; but the more common form is that of being split down the middle into two equal parts, of five each, as in *P. Dalbergioides*. The wood too resembles it. "Not unlike mahogany, but rather redder, heavier and coarser in the grain." It is often called "red wood" at Maulmain; and from the colour of the wood, some of the natives distinguish the species "red *Pa-douk*," being *P. Dalbergioides*, and "white *Pa-douk*," *P. Indicus*.

Both these trees produce an astringent gum, which has been exported for gum kino; or whether it was a mixture of both it is not possible to say. Probably the latter, as the native collectors would not probably make any distinction. Possibly it is the production of neither. It may be that *P. marsupium* is found in the Shan States, for it grows I believe in Assam; and the man that did not distin-

guish the two species in Maulmain, would not distinguish them from a third at Zimmay. Be that as it may, this is certain, that these provinces can furnish the commercial world with a large quantity of gum kino. If the result of the experiment which was made be correct, we have a great abundance of it within our own borders; for the Pa-douk is one of the most common forest trees in the provinces from the Tenasserim to the Salwan. It furnishes a considerable portion of the fuel that is sold in Maulmain. But if not, it is certainly abundant in the neighbouring provinces, whose only avenue to market is through our territories.—*Journal of the Asiatic Society of Bengal*, August 1848.

METEOROLOGICAL OBSERVATIONS FOR DEC. 1848.

Chiswick.—December 1. Foggy and drizzly: cloudy: rain, and boisterous at night. 2. Fine. 3. Clear: overcast: boisterous, with rain at night. 4. Boisterous, with heavy rain: clear at night. 5. Overcast: clear: slight rain. 6. Clear: heavy clouds. 7. Rain. 8. Slight rain. 9. Very fine. 10. Clear and very fine. 11. Foggy: cloudy. 12. Foggy: uniformly overcast. 13. Exceedingly fine. 14. Fine. 15. Hazy: rain. 16. Drizzly: constant heavy rain. 17. Cloudy: foggy. 18. Hazy: fine: densely overcast. 19. Foggy. 20. Hazy: clear and frosty at night. 21. Clear and frosty. 22. Frosty: clear: frosty. 23. Foggy: hazy: sharp frost. 24. Frosty: slight haze: overcast. 25. Hazy: cloudy. 26. Densely clouded. 27, 28. Fine. 29. Overcast. 30. Foggy: fine: foggy. 31. Foggy: hazy: foggy at night.

Mean temperature of the month	41°·75
Mean temperature of Dec. 1847	41·09
Mean temperature of Dec. for the last twenty years	39·66
Average amount of rain in Dec.	1·58 inch.

Boston.—Dec. 1. Cloudy: rain A.M. and P.M. 2. Fine. 3. Fine: rain P.M. 4. Cloudy: rain P.M. 5. Cloudy: rain A.M. 6. Fine: rain A.M. 7. Rain: rain A.M. and P.M. 8. Fine: rain P.M. 9—11. Fine. 12. Cloudy. 13. Fine. 14. Cloudy: rain P.M. 15. Cloudy: stormy, with rain from s.w. P.M. 16. Cloudy: rain P.M. 17, 18. Fine. 19. Rain: rain early A.M. 20. Cloudy. 21. Fine: plenty of ice this morning. 22—24. Fine. 25, 26. Rain. 27, 28. Cloudy. 29. Fine. 30. Cloudy. 31. Cloudy: a remarkable dark day.

Applegarth Manse, Dumfries-shire.—Dec. 1. Frost A.M.: rain and high wind P.M. 2. Rain: sleet: high wind: lightning. 3. Snow inch deep: heavy rain P.M. 4. Very high flood: heavy rain and high wind. 5. Fair, after very wet night: flood again. 6. Dull: drizzling: frost A.M. 7. Frost: damp and drizzly P.M. 8. Soft, moist and foggy. 9. Rain all day: high wind P.M. 10. Fair: high wind. 11. Fair and fine. 12. Dull and foggy A.M.: rain P.M. 13. Rain A.M.: showery all day. 14. Fair A.M.: rain and high wind P.M. 15. Fair A.M.: rain P.M., with storm of wind. 16. Fair and fine. 17. Frost A.M.: slight showers P.M. 18. Fair A.M.: cloudy: showery P.M. 19. Fair: fog: cleared P.M. 20. Frost: thaw P.M. 21. Frost, hard: clear and bracing. 22. Frost very hard: clear. 23. Frost keen: clear: wind rising. 24. Frost: high wind P.M. 25. Frost, slight: thaw P.M. 26. Rain very heavy: high wind. 27. Fair and clear: threatening frost. 28. Hard frost all day. 29. Hard frost. 30. Frost moderate: dull. 31. Frost moderate: cloudy.

Mean temperature of the month	39°·8
Mean temperature of Dec. 1847	40·2
Mean temperature of Dec. for the last twenty-five years .	38·2
Average amount of rain in Dec. for twenty years	2·94 inches.

Sandwich Manse, Orkney.—Dec. 1. Hoar-frost: rain. 2. Cloudy. 3. Rain: cloudy. 4. Showers: thunder: hail-showers. 5. Hoar-frost: showers. 6. Bright: showers. 7. Bright: clear. 8. Showers: rain. 9. Cloudy: rain. 10. Hazy: rain: clear. 11. Cloudy: clear. 12. Cloudy: rain. 13. Bright: showers. 14. Cloudy. 15. Bright: rain. 16. Showers: clear. 17. Showers: cloudy. 18. Cloudy. 19. Bright: clear. 20. Cloudy. 21. Bright: clear: aurora. 22. Clear: frost: clear: aurora. 23. Clear: frost: clear. 24, 25. Cloudy. 26. Rain: cloudy. 27. Showers: clear. 28, 29. Clear: frost: clear. 30, 31. Cloudy.